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ABSTRACT

This practicum was designed to increase the accuracy of reading decoding skills exhibited by five elementary and intermediate level hearing-impaired students in a mainstream setting. Subjects were fitted with appropriate amplification to optimize their residual hearing but were performing below their grade-level placement in the areas of word attack and word identification, and made numerous reading decoding errors during oral reading of curriculum materials. The outcome objectives aimed to improve the students' phonetic skills for sound/letter units, single words, and connected reading material. The strategy, which was implemented for a 12-week period in the students' special education class, incorporated the use of 70 sound/letter unit flashcards, a comprehensive word list, and the students' classroom reading text. Analysis of data revealed that all five students increased their accuracy for identifying sound/letter units and transferred this learning to single words and connected text. Results are reported using a case study format. (Contains 19 references.) (Author/JDD)

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Increasing the Accuracy of Reading Decoding Skills Exhibited by Hearing-Impaired Students With the Use of a Sound/Letter Unit Instructional Approach

by

Katharine E. Becker

Cluster 52

A Practicum I Report Presented to the
Ed.D. Program in Child and Youth Studies
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA UNIVERSITY

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PRACTICUM APPROVAL SHEET

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Approved:

7/26/93
Date of Final Approval of Report

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Dr. Mary W. Staggs, Ed.D., Adviser

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TABLE OF CONTENTS

Page

TITLE PAGE i

APPROVAL PAGE ii

ACKNOWLEDGEMENTS iii

TABLE OF CONTENTS iv

LIST OF TABLES v

ABSTRACT vi

Chapter

I INTRODUCTION 1

Description of Community 1
Writer's Work Setting and Role 2

II STUDY OF THE PROBLEM 9

Problem Description 9
Problem Documentation 10
Causative Analysis 12
Relationship of the Problem to the Literature . . 14

III ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS . . 22

Goals and Expectations 22
Expected Outcomes 22
Measurement of Outcomes 23

IV SOLUTION STRATEGY 26

Discussion and Evaluation of Solutions 26
Description of Selected Solution 33
Report of Action Taken 34

V RESULTS, DISCUSSION AND RECOMMENDATIONS 42

Results 44
Discussion 53
Recommendations 57
Dissemination 59

REFERENCES 60

LIST OF TABLES

Table

1 Results of Standardized Testing in Word Attack and Word Identification, Fall 1992 11

2 Pretest and Posttest Results for Outcome Objectives, Student A 45

3 Pretest and Posttest Results for Outcome Objectives, Student B 47

4 Pretest and Posttest Results for Outcome Objectives, Student C 48

5 Pretest and Posttest Results for Outcome Objectives, Student D 50

6 Pretest and Posttest Results for Outcome Objectives, Student E 51

7 Pretest and Posttest Results for Spelling Performance 53

ABSTRACT

Increasing the Accuracy of Reading Decoding Skills Exhibited by Hearing-Impaired Students With the Use of a Sound/Letter Unit Instructional Approach. Becker, Katharine E., 1993: Practicum Report, Nova University, Ed.D. Program in Child and Youth Studies. Descriptors: Reading Decoding/Phonics/ Phonetic Skills/Special Education/Disability/Speech/ Hearing-Impaired/ Elementary/Intermediate/Mainstream.

This practicum was designed to increase the accuracy of reading decoding skills exhibited by elementary and intermediate level hearing-impaired students in a mainstream setting. The five students who participated had hearing disability ranging from mild/moderate to severe/profound that was optimized with amplification. The outcome objectives aimed to improve the students' phonetic (phonics) skills for sound/letter units, single words, and connected reading material.

The solution strategy applied incorporated the use of 70 sound/letter unit flashcards, a comprehensive word list, and the students' classroom reading text. The flashcards and the word list were available through published sources. Pretests and posttests were administered. The solution was implemented for a 12-week period in the students' special education class.

Analysis of the data revealed that all five students increased their accuracy for identifying sound/letter units and transferred this learning to single words and connected text. Results obtained were reported using a case study format. Motivational factors and benefits to speech were discussed.

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CHAPTER I

INTRODUCTION

Description of Community

The practicum site was a large urban school district in the southwestern United States. The district is located in a lower middle-class bedroom community covering a 15 square-mile area. The ethnic composition of the community is approximately 50% Caucasian, 35% Hispanic, and 15% Afro-American. This ethnic breakdown is somewhat disproportionate to the ethnicity of the greater metropolitan area, which has 15% fewer minority residents.

The school district and the community share a long history of positive, active involvement. A Community Relations Office exists in the school district to respond to the ever-growing needs of the community. School and community representatives work together to develop programs, organize committees, and plan activities that will be mutually beneficial. Current activities include Family Math, Family Science, Volunteers in the Schools, Clothes Closet and Food Pantry, KinderKare, Community Coalition, Successful Parenting Skills classes, and school PTAs/PTOs. In addition, a Citizen's Advisory Board meets with district

officials once a month.

While the district and the community work together with an educational focus, they also collaborate in planning activities that are directed to the general health of district-area neighborhoods. Such activities include participation in the Block Watch Program, Gang Intervention Program, Graffiti Busters Program, Community Action Program, Neighborhood Clean-Up, and Neighborhood Fightback.

The district's Governing Board is made up of five members elected by residents of the district. Each Board member serves a four-year term without pay. The board members work diligently to improve the quality of education for youth in the community. These efforts have been recognized nationally. For instance, in 1991, the Board President received the National School Public Relations Association's Award of Honor.

Writer's Work Setting and Role

The school district was formed 110 years ago. The founding school was the only school in the area for 62 years. In 1956, a second school was built commemorating the first superintendent. Since 1956, the district has grown from two schools to seventeen. The district has been blessed with stability. The current superintendent, who has been recognized for outstanding leadership, was appointed in 1978 and is only the third superintendent in the district's long history.

The district consists of one Headstart/Preschool campus, fourteen elementary schools, three junior high schools, and one district office complex. There are nearly 15,000 students enrolled in the district. There is high student mobility, and slightly more than 60% of the students are on free or reduced lunch. Most students attend their home schools. The district services between 1,200 and 1,300 students in special education programs within 14 categories of disability.

There are approximately 770 certified teachers employed by the district, which translates to a student-teacher ratio of 19:1. Despite this favorable ratio, average class sizes are large because many personnel teach in special subject areas or in special programs. Of the 770 certified teachers, 40% have attained a Master's degree or higher. The district employs a total of 41 school and district-level administrators, one of the lowest numbers in the state for a district its size.

Although a traditional curriculum of reading, writing, math, and basic skills is emphasized, the district believes that the arts, computer literacy, and citizenship play a major role in the development and education of the students. Art, Music, Physical Education, and Library are offered through the regular curriculum for all elementary grades. These special subject classes are offered as electives at the junior high level. In addition, since 1989, the

district has offered voluntary after school academic assistance programs to all students, kindergarten through eighth grade.

The district's Hearing Impaired Resource Program provides educational instruction to hearing-impaired students using the oral method of communication, that is, the students use their aided residual hearing, speechreading, and speech for receptive and expressive communication. The hearing-impaired students are taught in classrooms with normally hearing students. Hearing-impaired students residing in the district who use an alternate method of communication (e.g., Total Communication) are eligible to receive educational services through the district's Hearing Impaired Resource Program. However, these students frequently choose to attend the local public day school for students with hearing impairment.

The writer is employed by the district as an itinerant (traveling) teacher for the Hearing Impaired Resource Program. As such, the writer provides educational support services to students with hearing impairment, preschool through eighth grade, who reside in the district.

Specifically, the writer's responsibilities in the work setting include the following: (1) conducting evaluations to determine students' eligibility for placement in the Hearing Impaired Resource Program; (2) convening multidisciplinary committee meetings to place students in

the Hearing Impaired Resource Program; (3) writing Individual Educational Programs for students in the Hearing Impaired Resource Program; (4) providing direct teaching and/or consultation services to hearing-impaired students; (5) providing consultation services to classroom teachers; (6) providing assistance in meeting hearing-impaired students' audiological needs; (7) assisting district personnel (e.g., nurses) in matters related to hearing; (8) ordering, providing, and maintaining a variety of hearing-related equipment; (9) giving inservice presentations to staff and regular education students on a variety of topics surrounding hearing; and (10) representing the district in out-of-district hearing-impaired program placements.

The population involved consisted of five oral hearing-impaired students. Each student was integrated in a regular classroom in the district. Each student received educational support services from the district's Hearing Impaired Resource Program. The writer was the itinerant teacher providing services to these particular students. In this context, the writer had the powerbase to implement the practicum.

The first student, whom the writer shall refer to as Student A, was a petite fourth-grade female of Hispanic origin. Student A had a bilateral mild-to-moderate hearing loss. She had been a student of the writer for one year.

The writer provided assistance with grade-level material in the areas of reading and spelling. Student A was very capable and exhibited virtually perfect classroom behavior.

The second student, whom the writer shall refer to as Student B, was a physically mature fifth-grade male of Hispanic origin. Student B had a bilateral moderate-to-severe hearing loss. He had been a student of the writer for four years. Student B entered the district from the local public day school at which time he repeated first grade. The writer provided assistance with grade-level material across the curriculum. Student B showed strength in the areas of thinking skills and math. He was friendly with a good sense of humor.

The third student, whom the writer shall refer to as Student C, was a physically average sixth-grade female of Caucasian origin. Student C had mild hearing loss in the right ear and a profound hearing loss in the left ear. The writer had taught this student since the beginning of the 1992-93 school year. Student C lacked the skills necessary to perform at grade-level in all subjects except math and handwriting. Nevertheless, she received the bulk of her instruction in the classroom because the classroom teacher individualized instruction whenever possible, employed cooperative learning, and modified assignments. The writer provided remedial and grade-level assistance across the curriculum. Student C was cheerful, agreeable, and very

considerate of others.

The fourth student, whom the writer shall refer to as Student D, was a physically average eighth-grade male of Caucasian origin. Student D had a bilateral mild-to-moderate hearing loss. Student D had been a student of the writer for six years. Student D received educational services through the junior high special education Rotating Resource Program. The writer provided remedial assistance in language arts as a part of that program. Student D showed strength in oral rather than written activities. He especially enjoyed games and contests. Student D was friendly, cooperative, and easy to talk with.

The fifth student, whom the writer shall refer to as Student E, was a physically mature eighth-grade female of Caucasian origin. Student E had a profound hearing loss in the right ear and a moderate-to-severe hearing loss in the left ear. Student E had been a student of the writer for eight years. Student E also received educational services through the junior high special education Rotating Resource Program. The writer provided remedial assistance in language arts as a part of that program. Although Student E was talkative with the writer, she was extremely shy in other classes.

The five students involved in this practicum were fit with appropriate amplification to optimize their residual hearing throughout the school day. This consistent and

appropriate amplification enabled the students to have functional residual hearing. That is, the students were able to effectively use their residual hearing for communicating and learning.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

This practicum focused on the problem that students in the Hearing Impaired Resource Program, whose residual hearing was optimized, exhibited poor reading decoding skills when reading aloud to the writer. Specifically, the students identified (read) words inaccurately and inconsistently when reading from curriculum materials. The inaccurate and inconsistent reading decoding abilities exhibited by the students indicated that the students were underutilizing phonetic skills when decoding written words.

The writer acknowledged that reading decoding was only one reading subskill with which hearing-impaired students experienced difficulty. However, the exact combination of reading subskills exhibited by a hearing-impaired student at any given time determined the overall proficiency of that student as a reader. Therefore, while the writer viewed reading as a unitary process, the writer believed its operational components could and should be examined individually. Hence, the writer focused on the component of reading decoding.

The discrepancy between what the reading decoding ability of these hearing-impaired students was and what the reading decoding ability could be was difficult to pinpoint. This was because success in this area would be determined by factors related to the students' hearing, in combination with ability and instructional factors. Even so, it could be generally stated that if the hearing-impaired students were learning language and receiving educational instruction using the same general processes as normally hearing children, a normal acquisition of reading was occurring. Thus, if reading acquisition was following a normal course, the students' potential for reading growth was unlimited.

Problem Documentation

Evidence of the existence of the problem was documented by results from standardized testing in two areas related to reading decoding. The two areas tested were word attack and word identification. This evidence was gathered by the writer for each of the five students in the fall of 1992. The test results are shown in Table 1.

Table 1

Results of Standardized Testing in Word Attack and Word Identification, Fall 1992

Student	Grade	Grade-Equivalent Performance	
		Word Attack	Word Identification
Student A	4	2.2 (-1.8)	3.6 (-0.4)
Student B	5	3.0 (-2.0)	3.6 (-1.4)
Student C	6	2.0 (-4.0)	2.8 (-3.2)
Student D	8	3.3 (-4.7)	3.6 (-4.4)
Student E	8	3.5 (-4.5)	3.1 (-4.9)

Note. Numbers in parenthesis indicate number of years/months below grade-level placement.

Data gathered for the five students involved in the practicum revealed that each student performed below grade level in the areas of word attack and word identification. Specifically, the students performed 1.8 to 4.7 years below their grade-level placement in word attack and 0.4 to 4.9 years below their grade-level placement in word identification. Moreover, four of the five students (Students B, C, D, and E) demonstrated significant delays in both areas. The writer also noted that, for the students tested, the gap between performance and grade-level placement tended to widen as the students advanced in grade

level.

In addition to conducting standardized testing, the writer gathered evidence of the students' reading decoding performance during one week of observation in the fall of 1992. During the week of observation, the writer noted that the students made numerous decoding errors when reading aloud from curriculum materials.

The documented problem concerned the writer. This was because hearing-impaired students who were being taught to read using oral techniques, paralleling the process that normally hearing children follow, needed to be developing and applying the decoding skills linked with this type of instruction. However, the evidence gathered by the writer indicated the students were not performing at grade level in this area. Yet, the students demonstrated oral communication skills effective for use in a hearing environment. Therefore, as with normally hearing children, efforts directed toward the problem of low reading decoding skills in the hearing-impaired students so described were justified and critical for the students' overall progress in reading.

Causative Analysis

While partial hearing may have exacerbated the students' difficulties with reading decoding, the writer believed there were four causes which more directly explained the students low performance in this area. Each

of the causes related to instructional factors occurring in the educational setting.

First, regular and special educators underestimated the reading decoding capabilities of the hearing-impaired students, even though the students had functional residual hearing. Many educators incorrectly assumed that the presence of a hearing loss prevented the students from developing the phonetic skills necessary to decode words. As a result, the students reading decoding capabilities were not sufficiently employed for their proper development.

Second, regular and special educators did not emphasize the use of phonetic skills to the extent that was required for the hearing-impaired students to thoroughly learn the reading decoding process. In order for newly-developing phonetic skills to be learned, they must be practiced. Because the students had incomplete access to the sound system, the application of phonetic skills for these students was more difficult than for normally hearing students. Accordingly, the students may have resisted consistently applying the skills. When this occurred, educators often lessened the decoding demands on the students. Thus, the students' performance in this area remained low.

Third, the district-supported reading program did not incorporate an instructional method that taught systematic and comprehensive reading decoding skills. The four

components of the district reading program (i.e., basal reading series, workbooks, worksheets, literature-based material) left many phonetic rules untaught. For example, when students were learning how to read (pronounce) the digraph /ea/, they were often taught that the digraph had one sound when, in fact, it has three. Consequently, when the students encountered words such as "head" and "break" the students were mystified as to the correct pronunciation.

Fourth, the hearing-impaired students did not acquire and apply phonetic skills in the time that was typically offered. Clearly, students with hearing loss need more practice with any material that relates to the sound system. The amount of practice a given student requires varies according to the student's ability, work habits, educational history, and severity of hearing impairment. When educators did not allow for sufficient practice, the reading decoding skills exhibited by students remained underdeveloped and underutilized.

Relationship of the Problem to the Literature

The literature by other professionals addressing the problem of low reading decoding skills exhibited by hearing-impaired students occurred, for the most part, in small sections in textbooks. Unfortunately, most professionals view this problem as a "given". Therefore, the writer conducted a review of the literature to reinforce the viability of the problem using a three-pronged approach.

First, a documentation of the importance of teaching reading decoding skills to both normally hearing and hearing-impaired students was presented. Second, the prevalence and effective use of basal readers for reading instruction with hearing-impaired students was offered. Third, the view that hearing-impaired students who have functional residual hearing may possess the auditory capacity for learning reading decoding skills was explored.

Understandably, learning to read is a complex process. It involves the coordination of an array of perceptual and conceptual skills to decipher written symbols and interpret their meaning. The complexity of the reading process is equaled by its importance as a basic life skill, and by the controversy surrounding how it should be taught.

A study by Vellutino (1991) provided an extensive summary of the research related to the long-standing debate of whether to use a code-oriented or a whole-language approach for reading instruction. Broadly speaking, Vellutino reported that research findings tended to support the premises underlying the code-oriented approach. He emphasized that attention to word identification, a major feature of the code-oriented approach, could not be disregarded because substantial evidence indicated that the comprehension processes is dependent upon fluent word identification.

The assertion that word identification should be

emphasized was supported by other research studies. In particular, research conducted by Gough and Tunmer (1986) provided evidence that "the ability to decode is at the core of reading ability, such that learning to decode is tantamount to learning to read" (p. 6). While these researchers acknowledged that the role of decoding in reading has long been controversial, they supported the view that skill in decoding of single words was highly correlated with comprehension of what was read.

Likewise, the importance of reading decoding was addressed in a report by the Commission on Reading (1985). According to the Commission, teaching systematic decoding was recommended in order to assist readers in quickly and accurately coordinating decoding with the process of constructing meaning from the text. The report went on to say that teaching the sounds associated with most letters as well as teaching the blending of sounds, was important for word identification.

Similarly, Liberman and Liberman (1990) maintained that in order to read, children must learn the alphabetic principle. That is, children must acquire an explicit awareness that words are formed by sounds represented by vowels and consonants in our alphabet. The authors claimed that readers must learn to appreciate that words have an internal sound and spelling structure. They stressed, however, that such learning need not be a disagreeable task.

Finally, Luetke-Stahlman and Luckner (1991) stated that it was important to consider using a phonetic decoding approach with auditorally capable hearing-impaired students. They asserted that it should be considered because research reported in the hearing literature strongly suggested that decoding skills play an important part in eventual reading acquisition.

The second area reviewed by the writer was literature connected with the prevalence and effectiveness of using basal readers for reading instruction with hearing-impaired students. This was done in order to ascertain whether basal readers, which often include a reading decoding component, were being employed in programs educating hearing-impaired students, and whether basal readers were considered to be useful vehicles for teaching reading decoding to students with hearing impairment.

LaSasso (1987) surveyed reading instructional practices used with hearing-impaired students in the United States. Specifically, data was collected pertaining to (1) the extent to which basal reading programs and language experience approaches (LEAs) were used and (2) the perceived strengths and limitations of basal readers and LEAs. Questionnaires were mailed to primary, intermediate, and secondary programs known to educate hearing-impaired children. Usable questionnaires were received from 478 programs representing more than 26,000 students. In brief,

data collection indicated that (1) more programs used basal readers than LEAs at all levels and (2) basal readers were perceived to be the best instructional approach (especially Reading Milestones, a language-controlled basal series). Respondents indicated that LEAs were perceived to be beneficial with regard to language appropriateness but that LEAs did not adequately address the range of reading skills necessary in a comprehensive reading program.

Hart (1978), an authority in the area of teaching reading to hearing-impaired students, suggested that utilizing a basal reading series could be advantageous for instruction in reading. Hart advocated using basal readers as part of a well-balanced reading program. She acknowledged that basal readers are organized to present reading experiences in a sequential and developmental fashion which promoted continuity in reading achievement.

Finally, Leutke-Stahlman and Luckner (1991) wrote that "many basal reading series can be used effectively with hearing-impaired students" (p. 277). However, they made the additional point that teachers should not use basal readers in a routine manner. Rather, instruction with basal readers should be flexible in accordance with the needs of individual students.

The third area reviewed by the writer was literature connected with hearing-impaired students' auditory potential for learning reading decoding skills. Arnold and Mason

(1992) investigated the reading and speech performance of hearing-impaired students in relation to that of their normally hearing classmates. The hearing-impaired group in the study had a mean hearing loss of 58.8 dB, were educated orally, and received special education support services at least once a week. The results of the reading performance scores between the two groups showed that there was no significant difference between the hearing and hearing-impaired groups in word accuracy. In addition, speech rating profiles revealed that 86% of the hearing-impaired students demonstrated speaking capabilities that were classified as either "intelligible" or "fairly easy to understand". Based on these results, Arnold and Mason concluded that previous researchers have overstated the effects that partial hearing losses have on the reading accuracy and oral expression abilities of hearing-impaired students.

This observation was reinforced by Leutke-Stahlman and Luckner (1991) who recommended using a phonetic approach for reading instruction with auditorally capable hearing-impaired students when it is reasonable to do so. Likewise, Hart (1978) substantiated the usefulness of a phonics approach for children with usable hearing, beyond the primary level. She maintained that children who are taught by the oral method frequently encountered phonics as part of the speech program and that, as a reading skill,

phonics encouraged children to attend to word elements.

Finally, according to Ross, Brackett, and Maxon (1991), maximizing residual hearing for auditory reception should be a paramount consideration. By making optimal use of a student's residual hearing, one is, in effect, "heading off some of their problems at the source; that is, appropriate amplification can mitigate the impact of the hearing loss" (p. 181). The potential for development in the acoustic aspects of reading is dependent on employing residual hearing to the greatest possible degree. The emphasis on the full exploitation of residual hearing has occurred with advances in technology over the past 30 years. Such advances have allowed hearing-impaired students to learn through the auditory channel and function more effectively in a hearing environment beyond what was previously thought possible.

The writer also reviewed literature related to the causes of hearing-impaired students' low performance in reading decoding. The review supported the causes previously put forth by the writer. For instance, the writer observed that educators (in the work setting) deemphasized phonetic skill development and application with the hearing-impaired students they encountered. This occurrence was alluded to by Leutke-Stahlman and Luckner (1991) who stated that, while phonetic information was inaccessible to some hearing-impaired students, it was

inappropriate to generalize this logic to all hearing-impaired students.

The second cause put forth by the writer, that the district-supported reading program contained an inadequate reading decoding instructional component, is similarly described by the Commission on Reading (1985). The Commission found that while most children were taught phonics in some form, the phonics instruction was not well-conceived and was poorly integrated into most reading programs. The Commission felt that the approaches to phonics utilized in most programs available today failed to teach children to consistently decode words.

Additionally, the writer's observation that hearing-impaired students required more practice to acquire and apply phonetic word analysis skills than was typically offered was substantiated in the literature. Specifically, Dry and Earle (1988) reported that reading was underpracticed even though the amount of time spent actually reading was thought to be an important determinant of a hearing-impaired student's eventual reading proficiency.

In conclusion, a review of the literature conducted by the writer supported the existence and the importance of the problem that was the focus of this practicum. In a like manner, the literature lent support to the causative analysis of the problem put forth by the writer.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals and Expectations

The goal of the writer was that the five students in the Hearing Impaired Resource Program (previously identified as Students A, B, C, D, and E), whose residual hearing was optimized, would increase their utilization of phonetic skills when decoding written words. Following from this, the writer expected that the increased utilization of phonetic skills would enable the students to decode written words more accurately when reading aloud to the writer.

Expected Outcomes

Evidence gathered from standardized testing in the fall of 1992, indicated that the five students were performing below their grade-level placement, four significantly so, in the areas of word attack and word identification. In addition, the writer observed that the five students made numerous reading decoding errors during oral reading of curriculum materials. Therefore, based on this evidence, the following outcome objectives were projected for this practicum:

Objective One

Students A, B, C, D, and E, will demonstrate an increase in isolated sound/letter unit identification skills.

Objective Two

Students A, B, C, D, and E, will demonstrate an increase in word recognition skills.

Objective Three

Students A, B, C, D, and E, will demonstrate an increase in oral reading skills for connected material.

Measurement of Outcomes

In designing and implementing the practicum, it was necessary for the writer to assess the specific outcome objectives. The assessment was accomplished by measuring each outcome objective for Students A, B, C, D, and E on a case-by-case basis. This was done in order to accommodate student differences related to hearing and ability.

Objective One. Prior to implementing the practicum, a pretest was administered to determine each student's level of performance with regard to identifying sound/letter units presented in isolation. To assess this, the writer used the sound/letter units appearing in Spalding and Spalding (1990). This type of measure was chosen because it yielded information regarding sound/letter unit identification skills specific to each student. The writer believed it was important to assess the students' identification skills at

the isolation level because individual sound/letter units comprise the basic elements from which decoding is performed. After implementing the practicum, data was collected using the same procedure for a posttest of each student. The posttest determined if an increase in sound/letter unit identification skills occurred as a result of practicum implementation.

Objective Two. Prior to implementing the practicum, a pretest was administered to determine each student's level of performance with regard to word recognition using an inventory measure. This type of measure was chosen because it yielded information regarding word recognition skills specific to each student. After implementing the practicum, data was collected using the same procedure for a posttest of each student. The posttest determined if an increase in word recognition skills occurred as a result of practicum implementation. The evaluation tool used to measure student performance in this area was Brigance Diagnostic Comprehensive Inventory of Basic Skills (1983) "Word Recognition Grade Placement". Pretests and posttests were administered and scored according to the instructions and criteria provided.

Objective Three. Prior to implementing the practicum, a pretest was administered to determine each student's level of performance with regard to oral reading of connected material using an inventory measure. This type of

measurement was chosen because it yielded information regarding oral reading skills specific to each student. After implementing the practicum, data was collected using the same procedure for a posttest of each student. The posttest determined if an increase in oral reading skills occurred as a result of practicum implementation. The evaluation tool used to measure student performance in this area was Brigance Diagnostic Comprehensive Inventory of Basic Skills (1983) "Oral Reading". Pretests and posttests were administered and scored according to the instructions and criteria provided.

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Solutions

The problem central to this practicum was that students in the Hearing Impaired Resource Program, whose hearing was optimized, exhibited poor reading decoding skills. That is, the students identified (read) words inaccurately and inconsistently when reading aloud from curriculum materials.

A review of the literature related to strategies aimed at improving the reading decoding skills of hearing-impaired students offered by other professionals provided a number of possible solutions. These solutions addressed general instructional techniques used with both hearing-impaired and normally hearing students.

Conway (1990) found that students who have slight hearing losses can be expected to acquire phonetic skills with minor instructional alterations. She pointed out, however, that students with severe-to-profound losses, who have functional residual hearing, may require more specialized instructional considerations in order to acquire phonetic skills. These included reliance on kinesthetic cues (learning how a sound feels when it is pronounced) and

visual cues (examining letter patterns). Conway stressed that teaching hearing-impaired students to combine auditory input, speech knowledge, and learned phonetic rules helped students learn how to pronounce unfamiliar words.

Hart (1978) warned against a haphazard presentation of phonetic skills to hearing-impaired students. She underscored the importance of using a fairly systematic approach for teaching word attack skills. To this end, she suggested that phonics instruction include attention to initial letters, final letters, blends, digraphs, and variations in vowel sounds.

A review of the literature in connection with current reading instructional approaches for hearing-impaired students indicated that the approaches typically used roughly parallel those used with other children (King & Quigley, 1985). These included basal readers, language experience, individualized instruction, and programmed reading. According to Bunch (1987), despite this array of existing curricular practices, reading difficulties experienced by hearing-impaired students continue to exist. As a result, educators in the field of hearing-impairment have engaged in a never-ending attempt to devise solutions to improve reading abilities for this population.

Specific solution strategies that have been put forward in response to the reading decoding difficulties experienced by hearing-impaired students were reviewed by the writer.

One approach, developed by Hart-Davis (1986), was a supplemental program which attempted to teach phonics to hearing-impaired students through the use of a microcomputer. In this program, the computer was employed directly to teach a standard phonics textbook by providing phonetic practice related to specific areas in the textbook. This was done in conjunction with phonologic practice provided by the teacher. The program required that students analyze the phonetic components of a word as well as learning its use in "everyday" language.

The results of using this approach were evaluated as "rewarding" by Hart-Davis. She claimed that the benefits of applying the computer in this way increased student interest in phonetic skills associated with reading. Nevertheless, the writer was unable to implement a computer-based solution strategy with the five students involved in this practicum because the necessary computer equipment was not available at the writer's various teaching sites.

A solution strategy frequently used by educators of hearing-impaired students was the basal reading series Reading Milestones (Quigley & King, 1984). This reading series was designed specifically for hearing-impaired students. It was designed as a set of readers with controlled vocabulary and syntax and employs the technique of "chunking" words within a sentence for semantic clarity.

Reading Milestones consists of eight levels of instruction, with ten books and ten workbooks at each level. The age/grade range spans beginning reading to approximately fourth grade.

In evaluating Reading Milestones, Bunch (1987) found that only secondary attention was given to decoding skills. This was verified by the writer, who has previously used Reading Milestones with hearing-impaired students. In the writer's experience, the series did not provide adequate emphasis on phonetic skills to be considered as a possible solution strategy for this practicum.

A third solution strategy used to improve the phonetic skills of hearing-impaired students was the Phonovisual method (Aukerman, 1984). The Phonovisual method was developed through the collaborative efforts of a teacher of the hearing impaired, a speech therapist, and a primary level regular education teacher in the 1940s. The method was based on the famous "Northampton Charts" (Clark School for the Deaf in Northampton, Massachusetts), an aid to speech correction used with hearing-impaired students. There were no Phonovisual readers or basal texts. The basic components of the method were special consonant and vowel charts, a textbook for teachers, magnetic boards for students, consonant and vowel workbooks, learning game books, and a series of six diagnostic tests. Evaluations by other professionals suggested that the Phonovisual method

was an easy and effective method of teaching phonetic skills.

The writer was familiar with the consonant and vowel charts which were available for purchase at many teaching supply locations. The writer has these small reference charts on display at various teaching sites. The charts are useful for reference purposes. However, the writer did not believe the Phonovisual method was a plausible solution strategy for this practicum for two reasons. First, the writer desired to find a solution strategy for teaching phonetic skills that departed from a workbook presentation. Second, it was the writer's impression that this method was only slightly more systematic and comprehensive than the phonetic skills program currently offered through the district-supported reading program.

Last, a solution strategy used to teach phonetic skills to normally hearing students, which would be appropriate for use with hearing-impaired students, was reviewed by the writer. Bruner (1990) advocated the use of the Spalding method, claiming that it was an "ingenious" and motivating way of teaching the systematic rules and comprehensive "body of knowledge about how the alphabetic principle works" (p. 124). The Spalding method was developed over a period of time from the 1930s to the 1950s as Spalding, its originator, searched for a better way to teach reading. For this reason, the Spalding method was considered to be a

compilation of a number of successful techniques picked up over years of actual classroom practice (Aukerman, 1984).

The Spalding method was considered to be an "interconnected" approach to reading instruction (Bruner, 1990). It was designed to integrate phonics, reading, writing, spelling, and language instruction into a total language arts program. The method involved the use of 70 flashcards ("phonograms"), 25 single-letter and 45 fixed-letter combinations of 2, 3, and 4 letters, representing the 45 basic sounds used in reading. In addition, the (extended) Ayers List, a list of more than 2,000 words frequently encountered in reading, was employed as an instructional tool. The students maintained specifically designated notebooks of the phonograms and words they were learning. Under the Spalding method, students began instruction by learning to say and write the phonograms. The students then wrote words and original sentences and, within a short period of time, started reading quality children's books.

Even though the Spalding method is considered to be a total language approach, it could be classified under the category of a basic phonics method because of the initial and continuous emphasis given to phonetic skill development. For this reason, the writer referred to the phonograms as sound/letter units. The basic sound/letter units were logical, were based on the alphabetic principle, and

represented most of the sound/letter combinations students encountered in reading. However, the method did not overload students with phonetic information. Rather, the sound/letter units could be taught in small enough sets that students maintained a high rate of learning.

Furthermore, the Spalding method was acclaimed for its motivational appeal. Bruner (1990) asserted that students actually enjoyed the method because it offered opportunities for immediate success. As a result, students who had experienced difficulty with reading decoding gained a sense of accomplishment which was a welcome boost to morale.

In evaluating the Spalding method, the writer determined that the method incorporated a systematic and comprehensive approach to teaching phonetic word analysis skills. At the same time, it offered a departure from the workbook format which was prevalent in so many approaches. Finally, while the writer was unable to utilize the method in its entirety due to time constraints, the writer considered that specific components of this method would integrate well into the writer's work setting. For these reasons, the writer concluded that utilizing specific elements of the Spalding method, as a supplement to the students' regular reading program, was a plausible solution strategy for this practicum.

Description of Selected Solution

The Spalding method emphasized the development and application of phonetic skills in a way that was unique. Advocates of the method claimed that the Spalding phonograms were correct by modern linguistic standards because they represented the "minimal speech units" (phonemes) of the language (Spalding & Spalding, 1990). In this way, the sound/letter units were an accurate visual representation of the sounds associated with print. Moreover, Spalding and Spalding (1990) asserted that 93% of the most frequently occurring words were phonetically decodable as taught by this method.

In planning and preparing for the special instructional program, the writer specified which elements of the Spalding method would be used. The writer selected materials and employed procedures that were feasible and practical for the work setting. The materials used were as follows:

- The Sound/Letter Unit Flashcards. Seventy 6" x 4½" cards displaying the single-letter and fixed-letter combinations which represent the 45 basic sounds used in reading. One side of each card displayed a letter unit (single-letter or fixed-letter combination) printed in boldface, lowercase type for student use. The other side showed key words in regular type for teacher use. Letter units comprised of more than one letter were marked with underlines. Numbers were also

used for secondary pronunciations. (The flashcards were published by The Spalding Education Foundation and are available at teaching supply locations.)

- The Word List. The writer adapted the word list appearing in Spalding and Spalding (1990). This comprehensive word list contained the 1800 most frequently used words compiled in their order of frequency and arranged in Sections A - Z.
- The Writing Road to Reading (Spalding & Spalding, 1990). This text provided background information as well as methodology information for teaching using the sound/letter unit flashcards and the word list. It also presented the sound/letter units in full-size, bound form.

These elements of the Spalding method were used in conjunction with each student's classroom basal reading text. The writer easily procured these materials.

Report of Action Taken

Each student participated in the special sound/letter unit instructional program for one hour per week for a total of 12 weeks. The nature of the program required that the 12 weeks be consecutively implemented. The procedures followed were the same for each student involved.

During the first week of implementation, a phonological inventory was administered to determine each student's

capability with the 45 basic sounds projected for instructional use. In administering the phonological inventory, the writer said each sound represented by the letter units. The sounds were delivered by live voice with auditory and speechreading information fully available. The students repeated each sound as it was delivered. Following this, the Brigance Diagnostic Comprehensive Inventory of Basic Skills (1983) "Spelling" pretest was given. This was done in order to establish each student's preinstructional spelling level to determine whether instruction in reading decoding would transfer to improvement in spelling. In addition, a letter was sent home with each student notifying the parents that the special instructional program had begun. In the letter an overview of plans for the 12-week period was presented along with suggestions for helping the students at home.

Next, a pretest was administered to each student for the first, second, and third objective according to the procedures discussed for measurement of outcomes. The students' starting point with regard to the word list was also determined. To accomplish this, each student read from the list until 10 words were missed. The section in which 10 words were missed was considered the beginning section for instruction to follow.

The students expressed an interest in the preliminary procedures and pretests that were being conducted. For this

reason, the writer shared the results of these initial measurements with the students. As this information was communicated, the students became acutely aware of the discrepancy between their present level of performance and their grade-level placement. When this occurred, the writer emphasized that, by applying themselves diligently during the instructional period, they could make progress in lessening the gap. The students were also informed that certificates of accomplishment would be awarded to those who learned at least 60 sound/letter unit flashcards. With this in mind, the students were motivated to put forth their best effort.

The instructional program, which began during the third week, contained three components. The first component involved presentation of and practice with the sound/letter unit flashcards at a rate of 10 flashcards per week for each student. The second component involved individual practice of words from the word list in appropriate sections previously determined for each student. The third component required that students read aloud from their classroom basal reading text. During oral reading from the word list and reading text, decoding errors made by each student were phonetically analyzed according to the flashcards presented, entered in a personal notebook, and reread correctly. This instructional format was followed for weeks three through six and weeks eight through ten, for a total of seven weeks.

During the first week of instruction, the writer introduced the first ten flashcards. The students practiced saying the sound(s) associated with each flashcard one at a time as presented by the writer. A small version of the same flashcards presented at school were sent home with the students for 10-15 minutes of nightly reinforcement. Over the course of the next three weeks, an identical presentation and practice procedure was followed. However, after the first week of instruction the students reviewed the flashcards previously presented before the next ten were introduced. Likewise, during the ensuing weeks flashcards presented at school were sent home for additional practice.

The students exhibited a great deal of excitement about the ten new flashcards introduced each week. As the flashcards were introduced, the students commented on whether the sound/letter units were familiar or not and whether the sound/letter units appeared easy or difficult. In addition, the students were surprised to discover that some of the letter units, such as /ch/, had multiple sounds. Similar surprise was shown for /ea/, /a/, and many of the letter units representing vowel sounds. Of special interest was /ough/, which had six sounds. Generally speaking, the students were pleased to learn the multiple sounds associated with particular letter units. Rather than being overwhelmed with the multiple sounds, the students discovered that this phonetic information provided

explanations for previous "pronunciation mysteries". Furthermore, the students found the multiple sounds associated with most letter units easy to say and remember because of their intonation patterns.

The second component of instruction, which involved reading words aloud from the word list, progressed at an individual pace. After weekly flashcards were introduced and practiced, the students read aloud from the word list. As the students read, the writer indicated whether words had been accurately read on a separate copy of the list. When 25 or so words were missed, the student was asked to stop reading. The decoding errors made by the students were phonetically analyzed and discussed with the students, entered in each student's notebook (by the writer), and reread correctly. As with the flashcards, the words were introduced and reviewed weekly.

When the students finished reading the word list, they demonstrated heightened anticipation about which words they had missed. As the words were reviewed with the students, mispronunciations were labeled as "careless" or "still learning". On many occasions, students expressed good-humored dissatisfaction with their oral reading when the "careless" list contained more than a few words. At the same time, the students showed interest and understanding with respect to their decoding errors for the "still learning" words when the words were phonetically analyzed

according to the flashcards that had been presented.

The third component of the instructional program involved the students reading aloud from their classroom reading text. This followed the weekly flashcard presentation and practice, and reading aloud from the word list. For this component of instruction, the students were allowed to read sections of their own choosing. Some students read stories from start to finish, while others read in a different section every time. As the students read, the writer noted mispronunciations on a separate copy of the reading material. Again, decoding errors made by the students were phonetically analyzed and discussed with the students, entered in each student's notebook (by the writer), and reread correctly. And, similar to the flashcards and word list, words missed during oral reading were introduced and reviewed weekly.

Gauging from student responses, reading aloud from the classroom text was enjoyable as well as beneficial in applying phonetic skills previously learned. In particular, Student A eagerly mapped out everything she wanted to read. Other students showed a similar interest by carefully reading the section they had chosen.

A midpoint check-up was conducted during the seventh week. This involved an assessment of each student's acquisition of the 40 sound/letter units presented in weeks three through six. A midpoint check-up was also performed

for the words missed when reading aloud from the word list and reading text (entered in each student's notebook). The midpoint check-up allowed the writer and the students to ascertain the amount of progress that had been made thus far during the instructional program.

Instruction resumed in the eighth, ninth, and tenth week. During this period of instruction, the remaining 30 sound/letter unit flashcards were introduced and practiced at school and at home. The procedures outlined for reading from the word list and reading text were also continued. However, due to the large number of flashcards being introduced and reviewed, the writer increased the time devoted to this component of the program in relation to the other two components. For example, by the eighth week, component one (flashcards) received 30 minutes, while components two and three (word list and reading text) received 15 minutes each. This was in contrast to 20 minutes for each component as was the case for the third through sixth week of instruction.

During the final two weeks, the writer administered a posttest for spelling and for each of the three objectives originally projected for the practicum. In addition, the students' parents were notified of the completion of the special instructional program. Following the administration of the posttests, the students' parents were provided with information on their child's progress and final results.

Similar information was related to each student's classroom teacher. Finally, the students who were able to correctly say (identify) at least 60 of the sound/letter units displayed on the flashcards received a certificate of accomplishment.

Except for minor adjustments, the writer did not have to deviate from plans originally made, and no roadblocks of significance were encountered along the way. Efforts as they were originally planned were supported by staff in the work setting, the students' parents, and the students themselves, which enabled practicum implementation to proceed smoothly.

CHAPTER V

RESULTS, DISCUSSION AND RECOMMENDATIONS

This practicum explored the problem of low reading phonetic decoding skills exhibited by five oral hearing-impaired students enrolled in the Hearing Impaired Resource Program. The students were mainstreamed in regular education classrooms and received special education services from the writer. Each student involved wore appropriate amplification to optimize residual hearing throughout the school day. According to documented evidence, the students, previously identified as Students A, B, C, D, and E, performed below their grade-level placement in the area of reading decoding, four significantly so. The inaccurate reading decoding abilities exhibited by the students indicated that the students were underutilizing phonetic skills when decoding written words.

While acknowledging that reading was a unitary process, the writer focused on reading decoding because of its proven impact on overall reading proficiency. The students involved were considered to be capable of acquiring and applying reading decoding skills because they were learning language and receiving educational instruction in ways similar to students with normal hearing. Therefore, whereas

partial hearing may have exacerbated the students' difficulties with reading decoding, instructional factors in the work setting more directly contributed to the students' low performance in this area.

As a supplement to the student's regular reading program, the writer chose to implement a solution strategy aimed at improving the students' reading decoding skills that was motivating, systematic, comprehensive, and departed from a workbook format. Moreover, the solution selected took into account variable in the work setting. To this end, the writer chose to utilize specific strategies offered by the Spalding method. The strategies selected were the 70 sound/letter unit flashcards and the comprehensive word list. The students' regular classroom basal reading texts were also included as part of the solution strategy.

The writer implemented this practicum individually for each student. This was done for two reasons. First, only two of the five students attended the same school. Second, the writer wanted to accommodate student differences related to ability and degree of hearing loss. Therefore, results were reported using a case study format.

Results

The writer projected three outcome objectives for this practicum. The first objective stated that Students A, B, C, D, and E would demonstrate an increase in isolated sound/letter unit identification skills. This objective was met by each of the five students. The second objective stated that Students A, B, C, D, and E would demonstrate an increase in word recognition skills. This objective was also met by each of the five students. The third objective stated that Students A, B, C, D, and E would demonstrate an increase in oral reading skills for connected material. This objective was met by each of the five students as well. Data describing each student's performance with each of the three outcome objectives is summarized and presented in the case studies to follow.

At the beginning of the special instructional program, Students A, B, C, D, and E were given a phonological inventory to determine their phonological capability with respect to the 45 basic sounds. Data describing each student's phonological performance is included in the case study presentations. Likewise, student progress with the instructional tools of the word list and classroom reading text is described. Finally, although not projected as a specific outcome, the students' pretest and posttest performance in spelling is summarized following the case study findings.

Student A

Student A, a fourth-grade female with a bilateral mild-to-moderate hearing loss, was able to correctly articulate each of the 45 basic sounds presented in the phonological inventory. As shown in Table 2, Student A correctly identified slightly more than half of the sound/letter units on the pretest while posttest results indicate correct identification of all 70. In addition, Student A showed an improvement of one grade level for word recognition and one-and-a-half grade levels for oral reading when pretest and posttest results were compared.

Table 2

Pretest and Posttest Results for Outcome Objectives, Student A

Objective	Pretest	Posttest
Sound/letter identification	39/70	70/70
Word recognition	Grade 3(7/10)	Grade 4(7/10)
Oral reading	Grade 3-2	Grade 5

Note. Items correct/items tested.

Student A began the word list (made 10 errors) in Section M. At the end of the instructional period, Student A had progressed to Section R. In progressing from Section M to Section R, Student A correctly read approximately 640 words. During instruction, Student A missed a total of 168 words while reading aloud from the classroom reading text. Of the 168 words originally missed, Student A correctly read 153 by the end of the instructional period.

Student B

Student B, a fifth-grade male with a bilateral moderate-to-severe hearing loss, was able to correctly articulate 41 of the 45 basic sounds presented in the phonological inventory. The sounds missed were "r", "w", "s", and "z". Although Student B misarticulated these sounds, the speech patterns of Student B were familiar to the writer and were taken into consideration during instruction. Pretest and posttest results for the three outcome objectives are presented in Table 3. Data collected indicate that Student B increased his ability to identify sound/letter units by 25, moved up one-and-a-half grade levels in word recognition, and moved up one grade level in oral reading.

Table 3

Pretest and Posttest Results for Outcome Objectives, Student B

Objective	Pretest	Posttest
Sound/letter identification	43/70	68/70[a]
Word recognition	Grade 3(10/10)	Grade 5(5/10)
Oral reading	Grade 3-1	Grade 4

Note. Items correct/items tested.

[a] Missed: /ea/ and /ough/.

Student B began the word list in Section M. When the instructional period was completed, Student B had progressed to Section Q. In progressing from Section M to Section Q, Student B correctly read approximately 520 words. During instruction, Student B missed a total of 179 words while reading aloud from the classroom reading text. Of the 179 words originally missed, Student B correctly read 149 by the end of the instructional period.

Student C

Student C, a sixth-grade female with a mild hearing loss in the right ear and a profound hearing loss in the left ear, was able to correctly articulate each of the 45 basic sounds presented in the phonological inventory. As

Table 2 shows, Student C correctly identified fewer than half of the sound/letter units when the pretest was administered, while correctly identifying all 70 during posttesting. Likewise, Student C showed an improvement of one grade level for word recognition and one-and-a-half grade levels for oral reading when pretest and posttest results were compared.

Table 4

Pretest and Posttest Results for Outcome Objectives, Student C

Objective	Pretest	Posttest
Sound/letter identification	25/70	70/70
Word recognition	Grade 3(8/10)	Grade 4(7/10)
Oral reading	Grade 2-2	Grade 4

Note. Items correct/items tested.

Student C began the word list in Section L. At the end of the instructional period, Student C had progressed to Section Q. In progressing from Section L to Section Q, Student C correctly read approximately 640 words. During instruction, Student C missed a total of 148 words while reading aloud from the classroom reading text. Of the 148 words originally missed, Student C correctly read 127 by the

end of the instructional period.

Student D

Student D, an eighth-grade male with a bilateral mild-to-moderate hearing loss, was able to correctly articulate 44 of the 45 basic sounds presented in the phonological inventory. The sound missed was voiceless "th". Although Student D misarticulated this sound, the speech patterns of Student D were familiar to the writer and were taken into consideration during instruction. Pretest and posttest results for the three outcome objectives are displayed in Table 5. Data collected indicate that Student D increased his ability to identify sound/letter units by 30 and improved one grade level in oral reading. Data also show that Student D increased his acquisition of word recognition skills (by three words) from pretest to posttest, even though his score for grade-level placement remained the same.

Table 5

Pretest and Posttest Results for Outcome Objectives, Student D

Objective	Pretest	Posttest
Sound/letter identification	31/70	61/70[a]
Word recognition	Grade 4(5/10)	Grade 4(8/10)
Oral reading	Grade 4	Grade 5

Note. Items correct/items tested.

[a] Missed: /s/, /a/, /ow/, /ou/, /ew/, /ui/, /ch/, /ey/, /si/.

Student D began the word list in Section L. When the instructional period was completed, Student D had progressed to Section Q. In progressing from Section L to Section Q, Student D correctly pronounced approximately 640 words. During instruction, Student D missed a total of 129 words while reading aloud from the classroom reading text. Of the 129 words originally missed, Student D correctly read 121 by the end of the instructional period.

Student E

Student E, an eighth-grade female with a profound hearing loss in the right ear and a moderate-to-severe hearing loss in the left ear, was able to correctly articulate 43 of the 45 basic sounds presented in the

phonological inventory. The sounds missed were "ch" and "zh". In addition, Student E has a high-pitched/nasal voice which adversely affects her overall intelligibility. However, the speech patterns of Student E were familiar to the writer and were taken into consideration during instruction. Table 6 presents pretest and posttest results for the three outcome objectives. As the results show, Student A increased her acquisition of sound/letter units by 34, improved one grade level in word recognition, and improved one-half grade level in oral reading.

Table 6

Pretest and Posttest Results for Outcome Objectives, Student E

Objective	Pretest	Posttest
Sound/letter identification	33/70	67/70[a]
Word recognition	Grade 3(6/10)	Grade 4(6/10)
Oral reading	Grade 3-2	Grade 4

Note. Items correct/items tested.

[a] Missed: /w/, /oy/, /ough/.

Student E began the word list in Section M. At the end of the instructional period, Student E had progressed to Section Q. In progressing from Section M to Section Q,

Student E correctly read approximately 520 words. During instruction, Student E missed a total of 155 words while reading aloud from the classroom reading text. Of the 155 words originally missed, Student E correctly read 123 by the end of the instructional period.

The spelling skills of Students A, B, C, D, and E were evaluated at the beginning and the end of the program. In so doing, the writer looked for improvement in spelling as a possible unexpected outcome. Results of the students' spelling performance are shown in Table 7. A comparison of pretest and posttest scores reveal that Students A and C went up one grade level, while Students B and D improved only by spelling more words correctly within the same grade level. Student E, however, showed no improvement within or between grade level(s).

Table 7

Pretest and Posttest Results for Spelling Performance

Student	Pretest	Posttest
A	Grade 3(8/10)	Grade 4(9/10)
B	Grade 5(6/10)	Grade 5(9/10)
C	Grade 3(9/10)	Grade 4(7/10)
D	Grade 4(7/10)	Grade 4(9/10)
E	Grade 5(6/10)	Grade 5(6/10)

Note. Items correct/items tested.

Discussion

The results, as reported by comparing pretest and posttest scores for the three objectives written, suggest that the solution strategy selected was appropriate for use in increasing the accuracy of reading decoding skills exhibited by the students. Furthermore, these findings seem to support the writer's assertion that hearing-impaired students who have functional residual hearing are capable of acquiring and applying phonetic skills, and that doing so may contribute to their overall reading proficiency.

Analysis of the results indicate that students responded positively to the use of the flashcards as a vehicle for increasing acquisition of sound/letter units. This was evidenced by the large number of sound/letter units

learned by each student. The writer concluded that two factors related to the flashcards contributed to this increased acquisition. First, the flashcards appeared to be motivational to the students. Second, the flashcard presentation format (i.e., single and fixed-letter combinations representing a minimal sound unit, or phoneme) was logical, stable, and therefore easier to learn.

In further analyzing the results, data showed that learning the sound/letter units transferred to improvement in word recognition, especially for four of the students. It was interesting to note that Student D, who showed the least improvement in word recognition, also learned the fewest sound/letter units. Although the writer had no proof, it was speculated that additional practice with the flashcards would have assisted Student D in correctly identifying more sound/letter units and transferring this learning to word recognition.

Two of the students who demonstrated improvement in word recognition seemed to relate this learning back to the flashcards. This was apparent when Student A and Student C remarked that certain words contained sound/letter units they had been practicing. Accordingly, it appeared that these students were pleased at having discovered that words were simply "sound/letter units put together" and, in turn, enjoyed examining the internal structure of words. Indeed, Student C's new attitude toward decoding was exemplified in

a remark made by Student C's classroom teacher who said, "She's not afraid to pronounce words anymore - she doesn't wait for the teacher to do it".

Finally, in analyzing the results of the outcome objectives, each student involved in the special instructional program demonstrated an improvement in (connected) oral reading. That is, each student made fewer decoding errors when reading aloud to the writer. This was, perhaps, the most encouraging finding and could be explained in terms of the objectives written and the solution strategy selected.

To illustrate, the students began each instructional session by practicing the sound/letter units (flashcards). This was followed by practice with single words (the word list). As a result, the students progressed from smaller to larger units whereby they experienced success. Moreover, work with the flashcards and the word list established a "mind set" for accurate pronunciation. The feeling of success and the mind set for accurate pronunciation carried over to reading aloud from the classroom text. After the students finished reading a particular passage, they showed a keen interest in which words they had missed. In fact, some children challenged themselves to miss fewer words than they had in the previous session. The writer had not observed this level of excitement about accuracy in oral reading previous to employing this special instructional

approach.

A feature of the solution strategy that offered particular benefit to the hearing-impaired students was the frequent speech practice the flashcards provided. In order to get a flashcard correct, the students' pronunciation of the letter unit appearing on the flashcard had to be as precise as possible (for individual students to the satisfaction of the writer). In this way, desiring to get a flashcard right inspired the students to use their best speech and/or develop better speech. In addition, the phonemic patterns presented by the flashcards were maximally instructive for hearing-impaired students. For instance, many of the flashcards present cognates (voiced/voiceless pairs) on the same card which required the students to make this vitally important distinction. Examples of this were the /s/ flashcard which says "s" and "z", the /ch/ flashcard which says "ch", ("k"), and "sh", and the /si/ flashcard which says "sh" and "zh". Based on this experience, the writer believes the phonemic arrangement of the flashcards could be beneficial for all hearing-impaired students who are striving for better speech.

Last, it was noted whether an increase in spelling performance occurred as a result of a focus on decoding using the strategy selected. While a comparison of pretest and posttest data showed that Students A and C demonstrated improvement in spelling, Students B, D, and E did not.

Therefore, these results seem to indicate that an increase in spelling performance would not be considered a predictable outcome based on the program as it was designed and implemented.

In conclusion, results of this practicum provided evidence that the students involved increased their acquisition of sound/letter units and, further, transferred this learning to improvement in word recognition and oral reading. In light of these results, the outcome objectives written and the solution strategy selected for this instructional approach were successful in increasing the accuracy of reading decoding skills exhibited by the hearing-impaired students.

Recommendations

Based on the present findings, the writer would not recommend altering the program as it was designed. However, in considering its replication in other work settings, the following recommendations are made:

1. Extend the instructional time for students who have not acquired all 70 sound/letter units, or have not demonstrated improvement in word recognition and/or oral reading.
2. Alter the rate of presentation of the sound/letter units according to students' abilities.
3. Employ good record keeping procedures to assist with implementation and to track the students'

progress. The writer found the following procedures helpful:

a. Provide the students with a list of the sound/letter units when administering testing. Using the flashcards for this purpose may be distracting to the students. This, or a similar list, can also be used to administer the phonological inventory.

b. Design a list of the letter units and the sound(s) each make on a separate sheet for use by the instructor when administering testing. Student responses can be marked easily using this format.

c. Prepare two copies of the word list for each student. This enables the instructor to inconspicuously note decoding errors made by the student while reading from the list. A duplicate copy of each student's reading text is helpful for the same reason.

d. Provide each student with a personal notebook. The notebook is a convenient devise for keeping track of words missed during oral reading over many weeks, as well as for housing the word lists and tests administered.

e. Make (or purchase) a complete set of sound/letter units for each student to use at

home. Smaller versions of the flashcards are available for this purpose.

Dissemination

Dissemination of the practicum is anticipated as follows:

1. Provide a copy of the final report to colleagues in the work setting who have expressed an interest in the project.
2. Submit a formal proposal for presentation of the practicum at an international convention of a major professional organization providing service in the field of hearing impairment.
3. Share the practicum with a local group of teachers of hearing-impaired students.
4. The writer's advisor plans to share a copy of the final report with a program specialist in the southeastern United States.

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